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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,658	02/09/2004	Xiaofeng Zhang	2855/110	1442

7590 05/03/2005

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EXAMINER

FIGUEROA, NATALIA

ART UNIT PAPER NUMBER

2651

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/775,658

Applicant(s)

ZHANG ET AL.

Examiner

Natalia Figueroa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

In figure 3, element 311 is not mentioned in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 15 is objected to because of the following reason(s):

The specification, while being enabling for measuring a current, does not reasonably provide enablement for determining if the head is defective. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to determine if a head is defective based on a measured current. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 7-8, 9-11 and 13-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakekado et al (USPN 6,359,746), hereinafter Kakekado.

RE claim 1, Kakekado discloses an apparatus, comprising a current measurement device; a head gimbal assembly including a head to at least one of read and write information signals from/to a moving storage medium (fig. 15 and disclosure thereof and col. 7, lines 19-21); said current measurement device electrically coupled to said head and said storage medium; and said current measurement device is to measure current between said head and said storage medium (or voltage wherein they are directly proportional, figs. 21-22 and disclosure thereof and col. 7, lines 23-37).

RE claim 2, Kakekado further discloses that said head is a magnetic head/slider (fig. 1, figs. 18A and 19, element 106 and col. 4, lines 16-25).

RE claim 3, Kakekado discloses an apparatus to measure contact between a magnetic recording head and a storage medium comprising a current measurement device (or voltage wherein they are directly proportional, abstract and figs. 21-22); a head gimbal assembly including a magnetic recording head (fig. 15 and disclosure thereof and col. 7, lines 19-21), said recording head electrically coupled to said current measurement device; and a storage medium coupled to said current measurement device; and said current measurement device to measure

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current between said magnetic recording head and said storage medium (or voltage wherein they are directly proportional, figs. 21-22 and disclosure thereof, col. 7, lines 23-37 and col. 16, lines 36-45).

RE claim 4, Kakekado further discloses that said storage medium is a rotating magnetic storage disk (fig. 1 and col. 4, lines 16-25).

RE claim 5, Kakekado further discloses that said magnetic storage disk is coupled to a spindle and said spindle is coupled to said current measurement device (figs. 21-22 and disclosure thereof).

RE claim 7, Kakekado further discloses that said current measurement device is an ammeter/voltage source (figs. 21-22, element 108 and disclosure thereof).

RE claim 8, said ammeter/voltage source is to supply voltage to said magnetic recording head (fig. 21-22, element 108 and disclosure thereof).

RE claims 9-11 and 13-14, method claims 9-11 and 13-14 are drawn to the method of using the corresponding apparatus claimed in claims 2-5 and 7-8. Therefore method claims 9-11 and 13-14 correspond to apparatus claims 2-5 and 7-8 and are rejected for the same reasons of anticipation as used above.

RE claim 15, Kakekado discloses a method of determining flying height characteristics for a disk drive (abstract) comprising coupling a current measurement device to a head of a head gimbal assembly (or voltage wherein they are directly proportional, abstract and figs. 21-22, element 108 and disclosure thereof); said head to at least one of read and write information signals from/to a moving storage medium coupling said current measurement device to a said storage medium (fig. 15 and disclosure thereof and col. 7, lines 19-21); measuring current

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between said head and said storage medium with said current measurement device (or voltage wherein they are directly proportional, figs. 21-22 and disclosure thereof and col. 7, lines 23-37); and determining that said head is defective based on said current measurement (or avoid wear and elongate its life, col. 26, lines 29-48).

RE claim 16, Kakekado discloses a method of determining glide height characteristics for a disk drive (abstract) comprising coupling a current measurement device to a glide head of a head gimbal assembly (or voltage wherein they are directly proportional, abstract and figs. 21-22, element 108 and disclosure thereof); coupling said current measurement device to a said storage medium; measuring current between said head and said storage medium with said current measurement device (or voltage wherein they are directly proportional, figs. 21-22 and disclosure thereof, col. 7, lines 23-37 and col. 16, lines 36-45); and determining presence of disk asperities based on said current measurement (or roughness, col. 28, lines 38-52).

RE claim 17, Kakekado discloses a method of controlling flying height of a magnetic head in a disk drive comprising coupling an ammeter/voltage source to the magnetic head of a head gimbal assembly (or voltage wherein they are directly proportional, abstract and figs. 21-22, element 108 and disclosure thereof); coupling said ammeter/voltage source to a rotating magnetic storage medium, applying voltage to said magnetic head (figs. 21-22, element 108 and disclosure thereof); measuring current between said head and said storage medium with said ammeter/voltage source; and adjusting an amount of applied voltage to said magnetic head based on said measure current (abstract and col. 6, lines 44-56 and col. 7, lines 29-38).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kakekado in view of Hampshire (USPN 5,329,409).

RE claim 6, Kakekado is relied upon for the same reasons of rejection as stated above. Kakekado fails to explicitly teach that said current measurement device is a current amplifier. However, Hampshire discloses such on (abstract and fig. 1 and disclosure thereof). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the apparatus as disclosed by Kakekado with the above teachings from Hampshire have an amplifier that will measure the current hence adjusting and adapting the current therefore avoiding data loss and head and disk failure.

RE claim 12, method claim 12 is drawn to the method of using the corresponding

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apparatus claimed in claim 6. Therefore method claim 12 corresponds to apparatus claim 6 and is rejected for the same reasons of anticipation as used above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following documents are cited to further show the state of the art with respect to head disk interference.

- a) Meyer et al (USPN 6,577,466): Discloses fly height control.
- b) Gillis et al (USPN 6,359,433): Discloses a sensor for avoiding loss of data on a disk.
- c) Quak et al (USPN 6,512,647): Discloses adjusting a current in an MR head.
- d) Meyer et al (USPN 6,366,416): Discloses fly height control.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Figueroa whose telephone number is (571) 272-7554. The examiner can normally be reached on Monday - Thursday 8:30-5:30.

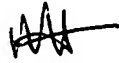
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to be 'NFM' with a stylized flourish.

NFM

A handwritten signature in black ink, appearing to be 'DAVID HUDSPETH' with a stylized flourish.

DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600